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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Tropospheric OH and Cl levels deduced from non-methane hydrocarbon measurements in a marine site" *by* C. Arsene et al.

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Short Communication for the manuscript entitled: Tropospheric OH and Cl levels deduced from non-methane hydrocarbon measurements in a marine site

This paper represents a first attempt to determine the Cl radical levels in the eastern Mediterranean region: a place where HCl evaporation from aerosols is expected to be at its highest levels.

Below, please find some of my comments on the manuscript:

Page 6337, the author shows that the i-butane/n-butane ratio varies between 0.3 and 3 for the rural site and 0.6 to 3 for the natural site, and from these variations the author concluded that there is a clear indication for the presence of Cl chemistry in the area.

This conclusion may not be so obvious since the concentration of hydrocarbons in the atmosphere could be affected by many factors like:

a) The regional ozone levels which are known to be constantly higher than other regions and so the reaction of ozone with Cl atoms is expected to be predominant. It is also known that the ozone reaction with Cl atoms is more favored at low organic concentration as it is the case in the natural site and less favored in the presence of higher levels of hydrocarbons.

b) The i-butane/n-butane ratios represented different periods during the day that could be a function of diurnal variational levels of several major reacting species like OH, Cl, O3, and NOx. The effect of Cl chemistry could be best shown at dawn since Cl atoms have been shown to be at their maximum concentrations.

Page 6350, the author in Table 3 lists the lifetime expectancy of NMHC after reaction with Cl and OH. By comparing Table 3 in this manuscript to Table 5 of Ezell et al. (PCCP 2002, 4, 5813), we see that the lifetime of propene for example with respect to reaction with Cl atoms is about one order of magnitude shorter that the reaction with OH. However, the lifetime of propene with respect to reaction with Cl as reported in the manuscript is longerĚ It is in the matter of days as compared to few hours for the reaction of propene with OH radicals. If the initial conditions chosen by the authors induce such changes clarification on this matter needs to be addressed.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 6329, 2007.